

CLAIMS

1. A honeycomb filter for purifying exhaust gases which has a structure in which:

5 a columnar body made of porous ceramic comprises a number of through holes that are placed in parallel with one another in the length direction with wall portion interposed therebetween; and

10 a part or all of said wall portion which separates said through holes functions as a filter for collecting particulates wherein

a length l (mm) of the longest side in a cross section perpendicular to said length direction of said through hole and a length L (mm) in the length direction of said columnar body
15 satisfy the following relationship: $60 \leq L/l \leq 500$,
and

a surface roughness R_a (according to JIS B 0601) of the inner wall of said through hole satisfies the following
20 relationship: $R_a \leq 100 \mu\text{m}$.

2. A honeycomb filter for purifying exhaust gases which has a structure in which:

a columnar body made of porous ceramic comprises a number of through holes that are placed in parallel with one another
25 in the length direction with wall portion interposed therebetween; and

a part or all of said wall portion which separates said through holes functions as a filter for collecting particulates,
wherein

30 an area S (mm^2) of the cross section perpendicular to the length direction of said through hole and the length L (mm) in the length direction of said columnar body satisfy the following relationship: $20 \leq L/S \leq 400$, and

a surface roughness R_a (according to JIS B 0601) of the
35 inner wall of the through hole satisfies the following

relationship: $Ra \leq 100 \mu\text{m}$.

3. The honeycomb filter for purifying exhaust gases according to claim 1 or 2,

5 wherein

the surface roughness Ra (according to JIS B 0601) of the inner wall of the through hole satisfies the following relationship: $1.0 \mu\text{m} \leq Ra \leq 100 \mu\text{m}$.

10 4. The honeycomb filter for purifying exhaust gases according to claim 1, 2 or 3,

wherein

the columnar body is constituted by combining a plurality of rectangular columnar porous ceramic members through adhesive
15 layer, each of said columnar porous ceramic member comprising a number of through holes that are placed in parallel with one another in the length direction with partition wall interposed therebetween.

20 5. The honeycomb filter for purifying exhaust gases according to claim 1, 2, 3 or 4,

wherein

a catalyst is supported thereon.

25 6. An exhaust gas purifying device comprising:

a casing connected to an exhaust gas passage of an internal combustion engine; and

the honeycomb filter for purifying exhaust gases according to claim 1, 2, 3, 4 or 5 and heating means, which are equipped
30 inside said casing,

wherein

upon carrying out a regenerating process for said honeycomb filter for purifying exhaust gases, gases heated by the heating means are flown into the honeycomb filter for purifying exhaust
35 gases under conditions that: a flow-in rate is 0.3 m/sec or more:

and an oxygen concentration is 6% or more.